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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/648,176	08/25/2003	Vladimir Gurevich	1400-42 (1575)	4436

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David M. Carter. Esq.
Carter, DeLuca, Farrell & Schmidt, LLP
Suite 225
445 Broad Hollow Road
Melville, NY 11747

EXAMINER	
FUREMAN, JARED	
ART UNIT	**PAPER NUMBER**
2876	

DATE MAILED: 05/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/648,176	GUREVICH ET AL.
	Examiner	Art Unit
	Jared J. Fureman	2876

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 March 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *25 August 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 2/8/2006 has been entered. Claims 1-28 are pending.

Claim Objections

2. Claims 27 and 28 are objected to because of the following informalities:

Claim 27, line 3: --first-- should be inserted before "wavelength", in order to provide a proper antecedent basis for "the first wavelength component" as recited in lines 5-6.

Claim 28, line 2: --first-- should be inserted before the second occurrence of "wavelength", in order to clarify the claim.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 15-26 are rejected under 35 U.S.C. 102(b) as being anticipated by Yoshida (EP 0 335 656 A1, cited by applicant).

Yoshida teaches a system and method for imaging, said system and method comprising: a reader (see figure 2) comprising an image sensor (image pick-up element 3, figure 2 and column 2, line 45) for imaging a target (whatever is within the image pick-up element's field of view, target screen H_f, for example) and generating a first, second and third data signal (amplitude values of blue, green and red signals S_B, S_G and S_R from the image pick-up element 3, A/D converter 12 and associated circuitry, see column 2, lines 56-58) representative of at least one parameter of a first, second and third wavelength component (the blue light L_B, green light L_G, and red light L_R) of said target impinging onto said image sensor, and at least one lens (zoom lens 2, figure 2, column 2, line 37) positioned for movement along an optical axis of said reader (see figure 2 and column 2, lines 43-55), wherein each of said at least one data signal represents a particular color (green light L_G, blue light L_B and red light L_R, see figure 3 and column 2, lines 43-55); a signal processor (auto-focus control circuit 10, which comprises a computer processing circuit such as a microprocessor, see figure 2 and column 3, lines 36-38) comprising means (means within the auto-focus control circuit 10, see column 3, line 36 - column 4, line 18) for performing an analysis (an analysis of the amplitude values of the blue, green and red signals S_B, S_G and S_R, respectively, see at least steps 104, 105, 110, 113 and 116 in figure 6) utilizing principles of axial chromatic aberration and at least one value indicative of the parameter of the at least

one wavelength component, wherein said analysis is performed while maintaining amplitude values respectively corresponding to a first, a second and a third wavelength component of the at least one wavelength component at substantially the same value (the analysis of the blue, green and red signals is performed while the respective amplitude values of the blue, green and red signals are substantially constant, since the position of the lens/focus ring is moved, if necessary, after the analysis is performed, see figure 6), and means (means within the auto-focus control circuit 10 and focus position control circuit 15, see column 4, lines 12-18) for determining an amount of movement of said at least one lens for adjusting a focus quality of an image corresponding to said target and impinged onto said image sensor, such that said amount of movement is determinative by data signals representing one or more colors (the blue, green and red signals S_B, S_G and S_R from the image pick-up element 3, see column 2, lines 56-58 and column 4, lines 3-32); an actuator (not shown, but necessarily present, see column 4, lines 12-18 and column 5, lines 30-36) operatively coupled to said at least one lens for moving said at least one lens along said optical axis of said reader by at least the determined amount for adjusting the focus quality of said image;

wherein said processor further comprises means (means within the auto-focus control circuit 10) for determining a distance to said optical target by accessing at least one data structure (a table of values stored in an internal ROM, not shown, see figure 5 and column 3, line 61 - column 4, line 32) and correlating the at least one value indicative of the parameter of the at least one wavelength component to said distance

(the properly focus position P is indicative of the distance to the optical target, see figure 4 and column 5, lines 1-42);

wherein said at least one wavelength component is selected from the group consisting of blue, green and red wavelength components (see column 3, lines 10-15);

wherein said means for performing said analysis comprises means for performing the steps of determining a difference by subtracting a first wavelength component of said at least one wavelength component from a second wavelength component of said at least one wavelength component (steps 104, 105, 110, 113 and 116, of the flow chart in figure 6, wherein it is determined whether one signal is greater than another, is analogous to subtracting a first wavelength component from a second wavelength component); determining whether the difference necessitates movement of said at least one lens along said optical axis (steps 106, 107, 111, 112, 114, 115, 117, 118, 119 and 120, see figure 6), wherein said amount of movement is determined if the difference necessitates movement of said at least one lens; and determining a direction of movement of said at least one lens according to whether the difference is positive or negative, if said difference necessitates movement of said at least one lens (see figure 6 and the corresponding description at column 6, line 5 - column 7, line 50);

wherein said means for performing said analysis comprises means for performing the steps of: determining a difference by subtracting said at least one value from a value stored within a memory (the values S_B', S_G' and S_R', represent the normalized values stored in the table stored in memory, see figures 5 and 6) or by subtracting said stored value from said at least one value and taking an absolute value

of said difference; and determining whether the difference necessitates movement of said at least one lens along said optical axis, wherein said amount of movement is determined if the difference necessitates movement of said at least one lens (see figure 6 and the corresponding description at column 6, line 5 - column 7, line 50);

wherein said method utilizes principles of axial chromatic aberration, wherein a first wavelength (S_B, see figure 4) having said first wavelength component has an optimum focus at a first focus plane (A, see figure 4) and a second wavelength (S_G, see figure 4) having said second wavelength component has an optimum focus at a second focus plane (P, see figure 4), and wherein said first and second focus planes are different due to axial chromatic aberration; (also see figures 2-6, column 2, lines 7-21, column 2, line 35 - column 5, line 42, column 6, line 5 - column 7, line 50 and column 8, lines 12-15).

5. Claims 27 and 28 are rejected under 35 U.S.C. 102(b) as being anticipated by Schaham (US 5,192,856).

Schaham teaches a method for determining a focus discriminator for a focusing system, said method comprising the steps of: generating a data signal (an output signal from CCD array 50) representative of a parameter of a first wavelength component of an image (the CCD array 50 receives an image, which necessarily includes wavelength components, the voltages in the signal generated by the CCD array represent the intensity and contrast present in the wavelength components of the image) onto an image sensor (CCD array 50) of said focusing system; performing an analysis by

subtracting a value (a new contrast value) indicative of the parameter of the first wavelength component from a stored value (a last calculated contrast value) corresponding to the first wavelength component, or subtracting the stored value (a last calculated contrast value) corresponding to the first wavelength component from the value (a new contrast value) indicative of the parameter of the first wavelength component to obtain a difference (a new contrast value is calculated and compared to a last calculated contrast value to determine an amount of change, see column 4, lines 16-31, thereby necessitating subtracting either the new contrast value from the last calculated contrast value or the last calculated contrast value from the new contrast value), wherein said difference is a focus discriminator indicating whether said image requires focusing by said focusing system (the amount of change from the last calculated contrast value is used as a focus discriminator, if the amount of change is smaller than a preselected value the optimum focus has been achieved, see column 4, lines 29-34) (also see figures 1, 2; column 2, lines 44 - column 4, line 41);

wherein said method utilizes the principles of axial chromatic aberration (the first lens 40 and second lens 42 are naturally subject to the principles of axial chromatic aberration, at least to some extent), wherein a wavelength having said first wavelength component has an optimum focus at a first focus plane and another wavelength having a second wavelength component has an optimum focus at a second focus plane, and wherein said first and second focus planes are different due to axial chromatic aberration (this is the principle of axial chromatic aberration) (also see figures 1, 2; column 2, lines 44 - column 4, line 41).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshida.

Yoshida teaches a system and method for imaging, said system and method comprising: a reader (see figure 2) comprising an image sensor (image pick-up element 3, figure 2 and column 2, line 45) for imaging a target (whatever is within the image pick-up element's field of view, target screen H_f, for example) and generating at least one data signal (amplitude values of blue, green and red signals S_B, S_G and S_R from the image pick-up element 3, A/D converter 12 and associated circuitry, see column 2, lines 56-58) representative of at least one parameter of at least one wavelength component of said target impinging onto said image sensor, and at least one lens (zoom lens 2, figure 2, column 2, line 37) positioned for movement along an optical axis of said reader (see figure 2 and column 2, lines 43-55), wherein each of said at least one data signal represents a particular color (green light L_G, blue light L_B and red light L_R, see figure 3 and column 2, lines 43-55); a signal processor (auto-focus control circuit 10, which comprises a computer processing circuit such as a microprocessor, see figure 2 and column 3, lines 36-38) comprising means (means within the auto-focus control circuit

10, see column 3, line 36 - column 4, line 18) for performing an analysis (an analysis of the amplitude values of the blue, green and red signals S_B, S_G and S_R, respectively, see at least steps 104, 105, 110, 113 and 116 in figure 6) utilizing principles of axial chromatic aberration and at least one value indicative of the parameter of the at least one wavelength component, and means (means within the auto-focus control circuit 10 and focus position control circuit 15, see column 4, lines 12-18) for determining an amount of movement of said at least one lens for adjusting a focus quality of an image corresponding to said target and impinged onto said image sensor, such that said amount of movement is determinative by data signals representing one or more colors (the blue, green and red signals S_B, S_G and S_R from the image pick-up element 3, see column 2, lines 56-58 and column 4, lines 3-32), wherein said analysis is performed while maintaining amplitude values respectively corresponding to a first, a second and a third wavelength component of the at least one wavelength component at substantially the same value (the analysis of the blue, green and red signals is performed while the respective amplitude values of the blue, green and red signals are substantially constant, since the position of the lens/focus ring is moved, if necessary, after the analysis is performed, see figure 6); an actuator (not shown, but necessarily present, see column 4, lines 12-18 and column 5, lines 30-36) operatively coupled to said at least one lens for moving said at least one lens along said optical axis of said reader by at least the determined amount for adjusting the focus quality of said image;

wherein said processor further comprises means (means within the auto-focus control circuit 10) for determining a distance to said optical target by accessing at least

one data structure (a table of values stored in an internal ROM, not shown, see figure 5 and column 3, line 61 - column 4, line 32) and correlating the at least one value indicative of the parameter of the at least one wavelength component to said distance (the properly focus position P is indicative of the distance to the optical target, see figure 4 and column 5, lines 1-42);

further comprising a feedback system, including the image sensor (image pick-up element 3) and the signal processor (auto-focus control circuit 10), for repeatedly generating the at least one data signal and performing said analysis, until said signal processor determines the target is in focus (also see the flow chart of figure 6);

further comprising a controller (focus position control circuit 15, see figure 3 and column 4, lines 12-18) for controlling the actuation of said actuator;

wherein said at least one wavelength component is selected from the group consisting of blue, green and red wavelength components (see column 3, lines 10-15);

wherein said means for performing said analysis comprises means for performing the steps of determining a difference by subtracting a first wavelength component of said at least one wavelength component from a second wavelength component of said at least one wavelength component (steps 104, 105, 110, 113 and 116, of the flow chart in figure 6, wherein it is determined whether one signal is greater than another, is analogous to subtracting a first wavelength component from a second wavelength component); determining whether the difference necessitates movement of said at least one lens along said optical axis (steps 106, 107, 111, 112, 114, 115, 117, 118, 119 and 120, see figure 6), wherein said amount of movement is determined if the

difference necessitates movement of said at least one lens; and determining a direction of movement of said at least one lens according to whether the difference is positive or negative, if said difference necessitates movement of said at least one lens (see figure 6 and the corresponding description at column 6, line 5 - column 7, line 50);

wherein said means for performing said analysis comprises means for performing the steps of: determining a difference by subtracting said at least one value from a value stored within a memory (the values S_B‘, S_G‘ and S_R‘, represent the normalized values stored in the table stored in memory, see figures 5 and 6) or by subtracting said stored value from said at least one value and taking an absolute value of said difference; and determining whether the difference necessitates movement of said at least one lens along said optical axis, wherein said amount of movement is determined if the difference necessitates movement of said at least one lens (see figure 6 and the corresponding description at column 6, line 5 - column 7, line 50); (also see figures 2-6, column 2, lines 7-21, column 2, line 35 - column 5, line 42, column 6, line 5 - column 7, line 50 and column 8, lines 12-15).

Yoshida fails to specifically teach the reader being an optical code reader; the target being an optical code; a decoder for decoding data encoded by said image; the processor performing said analysis until data is decodable by said decoder; the optical code reader further comprising an illumination apparatus for illuminating a field of view, said field of view including the optical code.

However, optical code readers are well known to those of ordinary skill in the art at the time of the invention. Furthermore, it was well known to those of ordinary skill in the art at the time of the invention that imaging type optical code readers may include a decoder for decoding data encoded by an image and an illumination apparatus (such as light emitting diodes) for illuminating a field of view, said field of view including the optical code. Furthermore, Yoshida teaches that the auto-focus system and method can be applied to other apparatus such as an image pick-up apparatus, a camera and so on that are used to pick up a still picture (see column 8, lines 12-15, of Yoshida).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include, with the system and method as taught by Yoshida, the reader being an optical code reader; the target being an optical code; a decoder for decoding data encoded by said image; the processor performing said analysis until data is decodable by said decoder; the optical code reader further comprising an illumination apparatus for illuminating a field of view, said field of view including the optical code; in order to take advantage of the improved auto-focus system and method as taught by Yoshida in an optical code reader.

Response to Arguments

8. Applicant's arguments filed 2/8/2006, regarding claims 1-26, have been fully considered but they are not persuasive.

Applicants argue that Yoshida sates that the amplitude values of the color signals SB, SG and SR change not only with the position of the zoom lens but also with the hue of the object (see page 13 of the amendment filed on 2/8/2006), and with reference to figure 5, Yoshida states that the amplitude values increase or decrease (see page 14 of the amendment filed on 2/8/2006). Applicant's claims 1, 9, 15 and 20 include the language "wherein said analysis is performed while maintaining amplitude values respectively corresponding to a first, a second and a third wavelength component of the at least one wavelength component at substantially the same value", and claim 25 includes the language "wherein said analysis is performed while maintaining amplitude values respectively corresponding to the first, the second and the third data signals at substantially the same value". It appears as though these limitations could be interpreted to mean that the analysis is performed while the respective first, second and third amplitude values are maintained at respective substantially constant values (that is, the respective first, second and third amplitude values are maintained at respective substantially constant values, but the values may differ from each other) or that the analysis is performed while the respective first, second and third amplitude values are maintained at values substantially equivalent to each other. However, it appears as though applicants do not have any basis to support the interpretation that the respective first, second and third values are maintained substantially equivalent to each other. Note applicant's figure 2A, which shows the amplitude values of the blue, green and red wavelength components when the lens 170 is at a given position (see figure 2A and page 9, line 22 - page 10, line 22 of the specification). Like Yoshida's figure 5,

applicant's figure 2A shows that at any given position of the lens, one of the amplitude values is different from the other two. Neither applicant's drawings or specification indicate that there is a focal position where the amplitude values of the blue, green and red wavelength components are substantially the same or equivalent to teach other. Thus, like Yoshida, the amplitude values of the blue, green and read wavelength components in the present invention are also dependent upon the position of the lens 170 and hue of the object in the image. For this reason, the claims have been interpreted to mean that the analysis is performed while the respective first, second and third amplitude values are maintained at respective substantially constant values (that is, the respective first, second and third amplitude values are maintained at a respective substantially constant value, but may differ from each other). Yoshida teaches performing an analysis of the amplitude values of the blue, green and red signals S_B, S_G and S_R, respectively, (see at least steps 104, 105, 110, 113 and 116 in figure 6) and then determining an amount of movement of the lens for adjusting a focus quality of the image (see at least steps 106, 107, 111, 112, 114, 115, 117, 118, 119 and 120 in figure 6). The analysis of the blue, green and red signals is performed while the respective amplitude values of the blue, green and red signals are substantially constant, since the position of the lens/focus ring is only moved, if necessary, after the analysis is performed (see figure 6). Since the position of the lens is not moved during the analysis and Yoshida does not teach that the hue of the object changes during the analysis, the respective amplitude values of the blue, green and red signals are maintained at

signals are maintained at respective substantially constant values during the analysis. Thus, the teachings of Yoshida meet the claimed limitations.

9. Applicant's arguments with respect to claims 27 and 28 have been considered but are moot in view of the new ground(s) of rejection. The teachings of Schaham have been discussed above.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Wakai et al (US 7,019,919 B2) and Krichever (US 6,981,642 B2) both teach optical focusing systems and methods.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jared J. Fureman whose telephone number is (571) 272-2391. The examiner can normally be reached on 7:00 am - 4:30 PM M-T, and every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael G. Lee can be reached on (571) 272-2398. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jared J. Fureman

Jared J. Fureman
Primary Examiner
Art Unit 2876

April 26, 2006